CHAPTER 1

Introduction

The ROBO-308 all-in-one single board computer is designed to fit a small controlling system with the 386SX embedded controller and standard 16-bit ISA Bus architecture. It is made to meet today's demanding pace, and keep complete compatibility with hardware and software written for the IBM PC/AT. It's beneficial to build up high performance, cost-effective system for VARs, or system integrators.

This slot board computer can run up to 40MHz with build-in 386SX processor, memory supports on board 4MB and one SIMM up to 20MB EDO DRAM. The on board enhanced IDE interface provides one channel to connect with two external hard disk drives for default PIO mode signals. The I/O chipset integrates a general Super I/O functions which include the floppy controller, two serial ports, one SIR (Serial Infra Red) port and one parallel port. The two high performance 16550 compatible UARTs are provided with 16-byte FIFOs, and the multi-mode parallel port supports ECP/EPP/SPP function. Besides, it is also to offer one optional RS-422/485 port for high-speed and long-distance data communication.

The pure ISA-bus interface makes the ROBO-308 works very easily with the legacy ISA applications. The on board 32-pin DIP socket supports M-system Disk-On-Chip products up to 72MB and one PC/104 interface provides flexible embedded platform. The Watch-Dog Timer function can be used to monitor your system status. Two 6-pin Mini-DIN connectors are provided to support PS/2 Mouse and Keyboard. The on board Flash ROM is used to make the BIOS update easier, one standard P8 power connector is reserved to directly get power from external power supply for stand alone application, the additional 5-pin shrouded connector is reserved for connecting to Keyboard interface on the Backplane. The high precision Real Time Clock/calendar is built in for accurate scheduling and storing configuration information. All these features make ROBO-308 excellent in single power (+5V) applications.

1-1 Check List

The ROBO-308 package includes the following basic items except this manual

- One ROBO-308 single board computer
- One Printer cable
- One FDC cable
- One IDE cable
- One 5-pin to 5-pin keyboard cable for Backplane connection
- One PE envelope with PC/104 accessories include
  - four pieces of hex standoffs
  - four pieces of screws

If any of these items is damaged or missed, please contact your vendor and save all packing materials for future replacement and maintenance.

1-2 Product Specifications

- **Main processor**
  Intel 80386SX compatible embedded controller up to 40MHz

- **BIOS**
  AMI system BIOS with 128KB Flash ROM

- **Main Memory**
  ◇ On board 4MB EDO DRAM only
  ◇ One expandable SIMM up to 16MB EDO
  Totally supports 20MB 5V EDO DRAM

- **Chipset**
  ALi M6117C CPU/core logic embedded controller

- **Bus Interface**
  Standard 16-bit ISA bus with golden finger and PC/104 bus

- **IDE Interface**
  Supports one enhanced IDE port up to two HDD devices with PIO mode 0

- **Floppy Drive Interface**
  Supports one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB),
  3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskettes

- **Serial Ports**
  Support two high-speed serial ports with 16-byte FIFOs and optional RS-422/485
  Interface shared with COM2

- **SIR Interface**
  Supports one IrDA 1.0 (SIR) wireless communication

- **Parallel Port**
  Support one ECP/EPP bi-directional parallel port

- **Keyboard Interface**
  Supports one 6-pin Mini-DIN connector and one 5-pin shrouded connector
  For external connection

- **PS/2 Mouse Interface**
  One 6-pin Mini-DIN connector

- **Auxiliary I/O Interfaces**
  System reset switch, external speaker, Keyboard lock and HDD active LED

- **Real Time Clock/Calendar (RTC)**
  Real Time Clock/calendar with battery backup for 10-year data retention

- **Watchdog Timer**
  30.5us to 512 sec. time-out intervals by software setting (resolution 30.5us)

- **Disk-On-Chip (DOC) Feature**
  Reserved 32-pin socket for M-system Flash Disk up to 72MB

- **External Power Connector**
  Supports one standard P8 power connector to enhance power driving and work on single power (+5V) application

- **Power Good**
  On-board power good generator with reset time, 300ms ～ 500ms

- **Physical and Environmental Requirements**
  - ◆ Outline Dimension (L X W) : 185mm (7.28") X 121.5mm (4.78")
  - ◆ Board Weight : 0.44 lb. (0.2kg)
  - ◆ PCB layout : 4 layer
  - ◆ Power Requirements : +5V @1.0A (typical)
  - ◆ Operating Temperature : 0℃ ～ 60℃ (32℉ ～ 140℉)
  - ◆ Storage Temperature : -20℃ ～ 80℃
  - ◆ Relative Humidity : 5% ～ 95%, non-condensing

1-3 System Architecture

In the following illustration, ROBO-308 gives a highly integrated system solution and a most up to date system architecture, which includes two main VLSI chips M6117C/M5113 to provide 386 CPU based system optimized for both cost and size.

The embedded Micro-controller M6117C provides a complete integrated solution for the system controller and data path components in a 386SX processor system. It provides internal 32-bit Intel 386SX core bus interface, EDO DRAM data bus to support one SIMM and on board 4MB memory, enhance IDE decoder interface, Watch-Dog Timer **(WDT)** enabled by BIOS Setup and software programming, Keyboard/Mouse control logic and standard ISA bus interface function.

The Super I/O controller M5113 incorporates two full-function Universal Asynchronous Receiver/Transmitters **(UARTs)** with programmable baud rate generator and a 82077 compatible Floppy Disk Controller **(FDC)**. With the infrared **(IrDA)** transmission, the M5113 supports wireless communication in computers and to other devices. It does also feature various Parallel Port modes including SPP, EPP, and ECP. Besides, the full function of IDE interface comes from combining M6117C IDE decoding with M5113 IDE control signals.

In addition, the M6117C also provides XD-bus to support BIOS read/write access and real-time clock **(RTC)** to maintain date and time of system. A standard PC/104 bus interface is applied for all of slower I/O operations, and disk-on-chip **(DOC)** for M-system Flash disk. The detail operating relations are shown as Figure 1-1 ROBO-308 System Block Diagram.

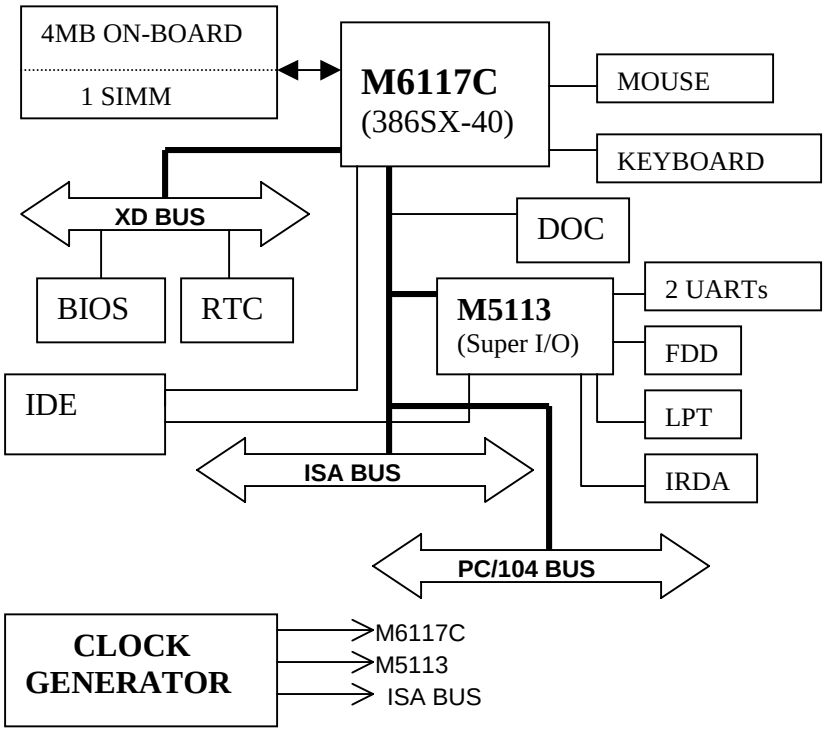

Figure 1-1 ROBO- 308 System Block Diagram